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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: FUMIO NARISAWA, ET AL

Serial No.: 09/253,944 Group Art Unit: 2124

Filed: FEBRUARY 22, 1999 Examiner: Todd D. Ingberg

Title: OBJECT-ORIENTED OPTIMIZATION CODE GENERATOR AND A METHOD THEREFOR

REPLY

Box Amendment **December 16, 2002**
Commissioner for Patents
Washington, D.C. 20231

Sir:

The following remarks are submitted in response to the Office Action dated June 14, 2002.

Claims 1 and 8 (all claims remaining of record in this application) have been rejected under 35 USC §102(b) as anticipated by Sweeney et al (U.S. Patent No. 6,230,314). However, for the reasons set forth hereinafter, Applicants respectfully submit that the present invention as defined in Claims 1 and 8 distinguishes over the Sweeney et al reference.

As indicated in previously submitted comments, Sweeney discloses the detection of situations where a member of a given class is used by some, but not all instances of that class. Accordingly, such member is eliminated from the

instances where it is not needed, so as to "optimize away" unneeded class members from objects, as discussed in the Abstract of the Disclosure, and in the Summary of the Invention.

However, Sweeney et al nowhere discloses the generation or elimination of objects themselves, so that a code dealing with plural instances is generated in all events. Thus, with the Sweeney et al arrangement, unnecessary components, including objects and codes, in a program are not eliminated fully. In this regard, Applicants refer, for example, to Column 1, line 66 through Column 2, line 3 of Sweeney et al.

On the other hand, in the present invention as defined in Claim 1, the software generation system includes "optimized information inputting means which permits to input from an external unit optimized information indicating necessity or unnecessity of dynamic generation function for dynamic generation of an instance representing one of a set of object oriented functions." Thus, the system of Claim 1 provides for the input of information on the necessity or the lack of necessity of object generation itself. Accordingly, unnecessary instances are eliminated, and codes dealing with plural instances are also eliminated. As a result, the total program size is reduced, and the memory capacity for storing such program is also reduced. In this regard, it should be noted carefully that, as defined in the specification of the present application, object oriented "functions" are the mechanisms or methods which are used to realize the "members". (See page 18, lines 2-11.)

In Sweeney et al, unnecessary components or members themselves are removed from objects of a program. (See Column 1, lines 43-46 and Column 2, lines 8-19.) This functionality is entirely different from the present invention, which, as noted previously, removes an object oriented function by which the member itself is realized. That is, in Sweeney et al the unneeded members themselves are removed, while in contrast, according to the present invention, the unneeded member realization methods, including the dynamic generation of instances, virtual functions and inheritances are removed.

This distinction is extremely important. For example, in Sweeney et al, all of the realization methods for the members are coded, regardless of whether they are necessary or not. Thus, even though some may be unnecessary, the codes are nevertheless stored in a memory, and perform no useful function. Accordingly, a large memory capacity is necessary, which cannot generally be accommodated in an inexpensive embedded control system of the type according to the present invention. As discussed above, Applicants' invention overcomes this problem by excluding the unnecessary member realization method itself from the generated program code.

The distinctions set forth above are discussed in the context of a specific example in the specification of the present application starting at page 8, line 14 and continuing through page 12, line 12. The specific examples are shown in Figures 3, 4 and 5. Figure 3, for example, shows a model pattern that indicates processing of an input from a sensor that is part of an automobile engine control.

Figure 4, on the other hand, shows an operational diagram which can be entered by an operator to provide a detailed description of a method, indicating a process of each object belonging to each class. Finally, Figure 5 shows an example of an input display screen of the function select items.

The operation of the object oriented function removal block 107 in the processing unit 105 in Figure 1, on the other hand, is illustrated in Figure 7, which is a flow diagram that shows in detail the steps performed by the invention by which unused functions are eliminated from the code. As noted previously, the distinction set forth in this portion of the specification is that object-oriented "functions" are the mechanisms or methods by which the "members" are realized.

As is apparent from the foregoing, while the overall objective of the Sweeney et al reference is similar to that of the present invention (that is, reducing the space required for storage of an overall code), it accomplishes its purposes in a fundamentally different manner by "optimizing away" unneeded class members from objects, as opposed to the present invention in which unnecessary functions are eliminated. Accordingly, Applicants respectfully submit that Claims 1 and 8 are patentable over the Sweeney et al reference.

If there are any questions regarding this reply or the application in general, a telephone call to the undersigned would be appreciated since this should expedite the prosecution of the application for all concerned.

If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response, and please charge any deficiency in fees or credit any overpayments to Deposit Account No. 05-1323 (Docket #381NP/47598).

Respectfully submitted,

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